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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/536,825	08/15/2005	Kazuhisa Watanabe	055471-0114	2217

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EXAMINER

ROMAN, LUIS ENRIQUE

ART UNIT	PAPER NUMBER
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2836

DATE MAILED: 04/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/536,825

Applicant(s)

WATANABE ET AL.

Examiner

Luis Roman

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 09/15/05, 05/27/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Objections

The claims are generally narrative and indefinite, failing to conform to current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. §103(a) as being unpatentable over Miller et al. (US 3872330) in view of and Takeuchi et al. (US 6528925).

Regarding claim 1 Miller et al. discloses a piezoelectric actuators, which a first and a second piezoelectric sheets are respectively attached to opposed surfaces of a plate interposed between the first and the second piezoelectric sheets (Col. 10 lines 9-16 & Fig. 6 elements (41, 42 & center plate), comprising: an actuator mechanically moving a mechanical component directly or indirectly connected to each of the piezoelectric actuators (implicitly disclose, a piezoelectric device produces movements/displacement which are related to mechanical events), a positive side feeder line directly connected in common to the opposite side of the first piezoelectric sheet to the side attached to the plate (Fig. 7 elements 11a, 11b, 11c, 21); and a negative side feeder line directly connected in common to the opposite side of the

second piezoelectric sheet to the side attached to the plate (Fig. 7 elements 11a, 11b, 11c, ground).

Miller et al. does not disclose a controller to selectively on-control and charge the second or the first piezoelectric sheet by applying a drive voltage to the first and the second piezoelectric sheets, by selectively connecting the positive side or the negative side feeder line to the plate side of the first or the second piezoelectric sheet, wherein the controller has a function to off-control the drive voltage applied to the first or the second piezoelectric sheet of each of the piezoelectric actuators selected to be on-controlled, and simultaneously with this, on-control the first or the second piezoelectric sheet of any other one of the piezoelectric actuators to be on-controlled next so as to apply the drive voltage thereto, and a discharging current is allowed to flow from the first or the second piezoelectric sheet of any one of the piezoelectric actuators subjected to off-control, and by this discharging current, the first or the second piezoelectric sheet of any other one of the piezoelectric actuators subjected to on-control is directly charged through the positive side or the negative side feeder line.

Takeuchi et al. teaches a piezoelectric driving circuit constituted of plural piezoelectric actuators, and the concept of discharging the piezoelectric elements reusing the energy of the element being discharged to charge the next element selected by the controller (Col. 1 lines 24-43).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Miller et al. device with the Takeuchi et al. device features because in piezoelectric driving circuit, where the piezoelectric element is charged and discharged, if discharging electric charges are discharged as Joule heat by resistance or the like, the power consumption becomes large and the calorific value becomes large. For this reason, the discharging electric charges are prevented from being discharged as heat as much as possible, and they are reutilized as the next charging power. As a result power consumption is reduced.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luis E. Román whose telephone number is (571) 272 – 5527. The examiner can normally be reached on Mon – Fri from 7:15 AM to 3:45 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571) 272-2800 x 36. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from Patent Application Information Retrieval (PAIR) system.

Status information for unpublished applications is available through private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LR/041106

Luis E. Román
Patent Examiner
Art Unit 2836



BRIAN SIRCUS
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